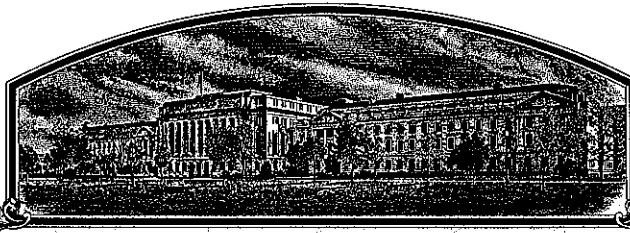


No.

9500070



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Sunderman Breeding Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Sunstar Double'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 29th day of February in the year of our Lord one thousand nine hundred and ninety-six.

Attest:

Marsha A. Hunter
Commissioner

Plant Variety Protection Office
Agricultural Marketing Service

John F. Whitman
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION - PLANT VARIETY PROTECTION OFFICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate)		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Sunderman Breeding Inc. ↑ MAS. 1/16/96		SDM 208B	Sunstar Double
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)		5. TELEPHONE (include area code)	FOR OFFICIAL USE ONLY PVPO NUMBER 9500070 DATE JAN 3 1995 FILING AND EXAMINATION FEE 2375 DATE JAN 3 1995 CERTIFICATION FEE 300 DATE 2-6-96
3754 North 2700 East Twin Falls ID 83301		208 733 0902	
6. FAX (include area code)			
7. GENUS AND SPECIES NAME	8. FAMILY NAME (Botanical)		
Hordeum vulgare L.	Gramineae		
9. CROP KIND NAME (Common name)			
6-row barley (facultative)			
10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) (Common name)			
Chapter S corporation			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION		12. DATE OF INCORPORATION	
Idaho		June 25, 1991	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS			14. TELEPHONE (include area code)
Donald Sunderman Sunderman Breeding Inc. 3754 North 2700 East Twin Falls ID 83301			208 733 0902
			15. FAX (include area code)
16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)			
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input type="checkbox"/> Exhibit C. Objective Description of the Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to PVPO)			
17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)?			
<input checked="" type="checkbox"/> YES #1 "yes," answer items 18 and 19 below <input type="checkbox"/> NO #1 "no," go to item 20			
18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?		19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?	
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?			
<input type="checkbox"/> YES #1 "yes," give names of countries and dates <input checked="" type="checkbox"/> NO			
21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.			
The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.			
Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT (Owner(s))		SIGNATURE OF APPLICANT (Owner(s))	
Donald Sunderman			
NAME (Please print or type)		NAME (Please print or type)	
Donald Sunderman			
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
President	12/20/94		

14 Exhibit A Origin and breeding history of the variety

Sunstar Double was selected from a cross of Eight-Twelve with Steptoe. The cross was made in the spring of 1987. The F₁ generation was grown in the greenhouse and the F₂ and F₃ generations planted in the field in the springs of 1988 and 1989. In the fall of 1989, 1500 F₄ lines were planted at Aberdeen ID and the more hardy ones selected for planting in a 1990-91 winter nursery. Subsequent tests have shown Sunstar Double to be slightly more winterhardy than Eight-Twelve.

Sunstar Double has shown stability for all phenotypic characters for the years 1991 through 1994 and has shown no indication of mutation or segregation.

14 Exhibit B Novelty Statement

Sunstar Double is most similar to 6-row barley Eight-Twelve.

The absolute and consistent differences between Sunstar Double and Eight-Twelve are:

1. Sunstar Double has Kernels with blue aleurone. Eight-Twelve does not.
2. Sunstar Double is facultative in growth habit. Eight-Twelve is not.
3. When compared with Eight-Twelve, Sunstar Double has unique prolamin bands about 3/4 of the way down the gel. It is heterogeneous, but not for prolamins.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Barley)

OBJECTIVE DESCRIPTION OF VARIETY
BARLEY (*HORDEUM VULGARE*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

Sunderman Breeding Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

3754 North 2700 East

Twin Falls ID 83301

FOR OFFICIAL USE ONLY

PVPO NUMBER

9500070

VARIETY NAME OR TEMPORARY
DESIGNATION

Sunstar Double

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. or) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

2 1 = SPRING 2 = FACULTATIVE WINTER 3 = WINTER 2 Early Growth: 1 = PROSTRATE 2 = SEMIPROSTRATE
3 = ERECT

2. MATURITY (50% Flowering):

2 1 = EARLY (California Mariout) 2 = MIDSEASON (Betzes) 3 = LATE (Frontier)

1 No. of days Earlier than 9 } 1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON
 3 No. of days Later than 8 } 5 = PIROLINE 6 = PRIMUS 7 = UNITAN 8 = Eight twelve 9 = Scio

3. PLANT HEIGHT (From soil level to top of head):

3 1 = SEMIDWARF 2 = SHORT (California Mariout) 3 = MEDIUM TALL (Betzes) 4 = TALL (Conquest)

0 7 Cm. Shorter than 8 } 1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON
 0 7 Cm. Taller than 9 } 5 = PIROLINE 6 = PRIMUS 7 = UNITAN 8 = eight twelve 9 = Scio

4. STEM:

2 Erection (Flag to spike at maturity): 1 = 0 - 3 cm. 2 = 3 - 10 cm. 1 Anthocyanin: 1 = ABSENT 2 = PRESENT
3 = 10 - 15 cm.

0 6 NO. OF NODES (Originating from node above ground)

2 Collar Shape: 1 = CLOSED 2 = V-SHAPED 3 = OPEN 1 Shape of Neck: 1 = STRAIGHT 2 = SNAKY
4 = MODIFIED CLOSED OR OPEN 3 = OTHER (Specify) .

5. LEAF:

1 Basal leaf sheath (seedling): 1 = GLABROUS 2 = PUBESCENT 2 Position of flag leaf (at boot stage): 1 = DROOPING
2 = UPRIGHT

2 Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY MM. WIDTH (First leaf below flag leaf)

CM. LENGTH (First leaf below flag leaf) 1 Anthocyanin in leaf sheath: 1 = ABSENT 2 = PRESENT

6. HEAD:

2 Type: 1 = TWO-ROWED 2 = SIX-ROWED 3 Density: 1 = LAX 2 = ERECT (Not dense)
3 = ERECT (Dense)

2 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 1 Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY
4 = OTHER (Specify) 3 = WAXY

1 Lateral Kernels Overlap: 1 = NONE 2 = AT TIP 3 Rachis (Hair on edge): 1 = LACKING 2 = FEW 3 = COVERED
3 = 1/4 - 1/2 OF HEAD

7. GLUME:

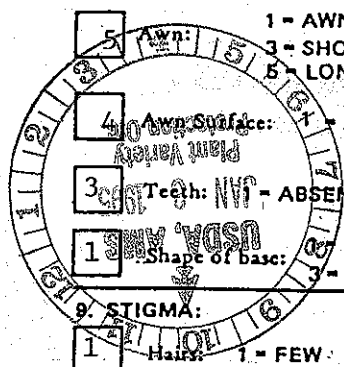
2 Length: 1 = 1/3 OF LEMMA 2 = 1/2 OF LEMMA 3 Hairs: 1 = NONE 2 = SHORT 3 = LONG
3 = MORE THAN 1/2 OF LEMMA

4 Hair covering: 1 = NONE 2 = RESTRICTED TO MIDDLE 3 = CONFINED TO BAND 4 = COMPLETELY COVERED

2 Awns: 1 = LESS THAN EQUAL TO LENGTH OF GLUMES 2 = EQUAL TO LENGTH OF GLUMES
3 = MORE THAN EQUAL TO LENGTH OF GLUMES

3 Awn Surface: 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

8. LEMMA:



1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS
 3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike)
 5 = LONG (longer than spike) 6 = HOODED

1 = AWNLESS 2 = SMOOTH 3 = SEMISMOOTH 4 = ROUGH

Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS

1 Hair: 1 = ABSENT 2 = PRESENT

Shape of base: 1 = DEPRESSION 2 = SLIGHT CREASE
 3 = TRANSVERSE CREASE

1 Rachilla Hairs: 1 = SHORT 2 = LONG

9. STIGMA:

1 Hair: 1 = FEW 2 = MANY

10. SEED:

2 Type: 1 = NAKED 2 = COVERED

1 Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT

3 Length: 1 = SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.)
 4 = MIDLONG TO LONG (9.0 - 10.5 mm.) 5 = LONG (10.0 mm.)

3 Wrinkling of hull: 1 = NAKED 2 = SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED

2 Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE

0 1 PERCENT ABORTIVE

4 2 GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

<input type="checkbox"/> SEPTORIA	<input type="checkbox"/> NET BLOTCH	<input type="checkbox"/> SPOT BLOTCH	<input type="checkbox"/> POWDERY MILDEW
<input type="checkbox"/> LOOSE SMUT	<input type="checkbox"/> BACTERIAL BLIGHT	<input type="checkbox"/> COVERED SMUT	<input type="checkbox"/> FALSE LOOSE SMUT
<input type="checkbox"/> STEM RUST	<input type="checkbox"/> LEAF RUST	<input type="checkbox"/> SCAB	<input type="checkbox"/> SCALD
<input type="checkbox"/> AY	<input type="checkbox"/> BSMV	<input type="checkbox"/> BYDV	<input type="checkbox"/> OTHER (Specify)

12. INSECT: (0 = Not tested, 1 = Susceptible, 2 = Resistant)

<input type="checkbox"/> GREEN BUG	<input type="checkbox"/> ENGLISH GRAIN APHID	<input type="checkbox"/> CHINCH BUG	<input type="checkbox"/> ARMYWORM
<input type="checkbox"/> GRASS HOPPERS	<input type="checkbox"/> CEREAL LEAF BEETLE	<input type="checkbox"/> OTHER (Specify)	
HESSIAN FLY RACES	<input type="checkbox"/> GP	<input type="checkbox"/> A	<input type="checkbox"/> B
	<input type="checkbox"/> D	<input type="checkbox"/> E	<input type="checkbox"/> F
			<input type="checkbox"/> C
			<input type="checkbox"/> G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ DDT ☐ OTHER (Specify)

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Eight twelve	Seed size	
Leaf size	"	Coleoptile elongation	Eight twelve
Leaf color	"	Seedling pigmentation	
Leaf carriage	"		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

1. Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
2. Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
3. Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

14 C Objective description of the variety

Sunstar Double is a moderately stiff strawed variety, intermediate in maturity and height. It has averaged 7 cm shorter in height than Scio and Eight-twelve. Heads are six rowed, strap in shape and dense. Kernels are midlong and have blue aleurone. Sunstar Double grows equally well as a winter or spring variety. However, the yield of Sunstar Double is not equal to the best spring varieties when spring grown.

14 D Additional description of the variety

Sunstar Double has yielded 219.5 bushels per acre in the two-year, 10-station average for yield for varieties grown under irrigation in southern Idaho. Eight-twelve, Sprinter and Scio grown in the same trials had yields of 216.4, 220.8 and 212.3 bushels per acre, respectively. In the 1994 Parma (western Idaho irrigated) trial, The respective yields of the varieties were 157, 134, 132, and 117 bushels per acre. The seed test weight of the varieties was similar.



14 E Statement of basis of applicants ownership

The variety, Sunstar Double, for which plant variety protection is hereby sought was selected from progeny of a cross made by Donald Sunderman. Development and testing was carried out by him or under his supervision. All rights to the variety are assigned to Sunderman Breeding Inc.



Summary of Agronomic data obtained on winter barley in the 1993-94 trials

Variety or SDM No.	Height 4-Sta Ave.	Yield				Test Weight							
		Twin Falls		Robertson		Twin Falls		Robertson					
		SDM	Robert- son	Burley Aber- deen* Aber.	Wesen- berg Ave.	SDM	Robert- son	Burley Aber- deen	Wesen- berg Ave.				
Sunstar Double	34.5	200.3	143.6	162.5	111.8	224.7	168.6	49.6	52.9	52.6	45.0	53.0	50.6
SDM 204B	37.5	197.4	164.3	152.7	138.0	211.7	172.8	50.5	51.3	51.5	47.6	50.0	50.2
Eight-12	36.8	185.3	141.3	146.2	130.3	224.0	165.4	48.7	52.3	49.5	46.8	51.6	49.8
Sprinter	38.8	202.8	145.6	133.5	100.3	225.8	161.6	52.5	53.1	51.9	44.2	51.9	50.7
Scio	36.0	186.2	129.9	129.4	96.8	224.0	153.3	48.9	52.3	49.5	46.8	50.5	49.6

* Robertson's Aberdeen trial was stressed for moisture several times during the growing season.

Agronomic data for varieties grown in University of Idaho trials for 2 years 1992-3 and 1993-4 at Aberdeen.

Variety or Selection	YIELD	Test Weight				Heading				Height				Lodging	
		92-93		93-94		Date From		January 1		in		92-3		93-4	
		92-93	93-94	2-Yr Ave	2 Yr Ave.	92-93	93-94	2Yr. Ave	92-3	93-4	Ave	2 Yr	Ave	2 Yr	Ave
Sunstar Double	214.3	224.7	219.5	52.6	53.0	52.8	150	153	152	31	31	31	31	2.5	2.5
SDM 204B	252.1	211.7	231.9	52.6	50.0	51.3	155	160	158	34	36	35	35	3.5	3.5
Eight-12	208.8	224.0	216.4	51.5	51.6	51.6	147	151	149	35	33	34	34	3.0	3.0
Sprinter	215.8	225.8	220.8	52.3	51.9	52.1	156	162	159	34	36	35	35	2.5	2.5
Scio	200.5	224.0	212.3	51.1	50.5	51.1	150	155	153	33	34	34	34	2.5	2.5

9500070



United States
Department of
Agriculture

Agricultural
Research
Service

Pacific West Area
Wheat Genetics, Quality
Physiology and Disease
Research Unit

9500070
209 Johnson Hall, WSU
Pullman, WA 99164-6420
(509) 335-6197
(509) 335-2872 (fax)
jones@wsuvm1.csc.wsu.edu

December 12, 1994

Dr. Donald Sunderman

Dear Don:

Enclosed are the pictures. Sorry I haven't been able to rerun them yet our protein person has been sick. We are redoing them this week though and send better pictures when we get them.

SUNSTAR PROMISE 80M406: Unique at 1B locus, has bands 7+8.

SUNSTAR DOUBLE SDM 208B: Unique prolamin bands (about 3/4 of the way down the gel). Heterogeneous but not for the prolamins.

SUNSTAR PRINCE SDM 306B: Very similar to Steptoe. No differences? Can't tell much from the gel but does not appear to be any unique bands when compared to Steptoe.

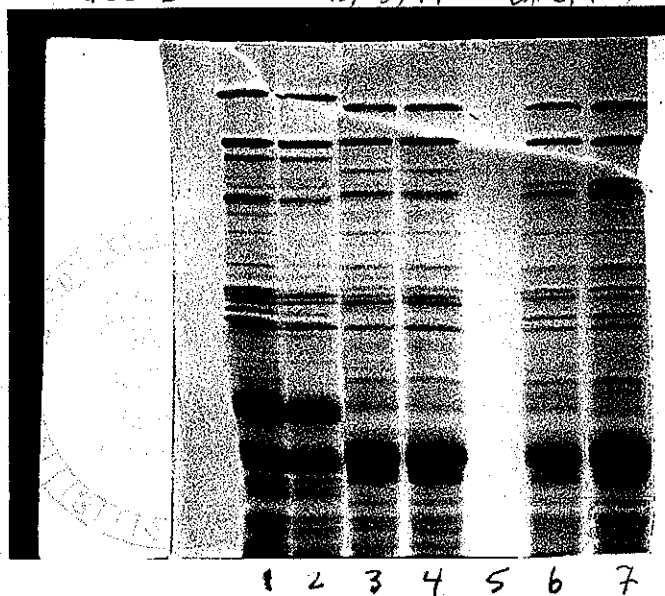
Hope this gets to you in time. Sorry about the delay. Call if you have questions. I'll let you know when the new pictures come if we see anything new on SDM 306B.


Steve

VARIETIES OR SELECTIONS TESTED USING ELECTROPHORESIS

LANE		
1	CENTENNIAL	
2	"	
3	SDM 406	Sunstar Promise
4	"	
5	BLANK	
6	PENAWAWA	
7	"	
8	STEPTOE	
9	"	
10	SDM 203 B	Sunstar Double
11	"	
12	SDM 306 B	Sunstar Prince
13	"	
14	WESENBERG'S RELEASE	Eight-Twelve
15	"	
16	CHINESE SPRING	

GEL #2 12/05/94 LANES 1-7



GEL #2 12/05/94 LANES 8-16 Vic

